

MOSQUITO CONTROL AROUND THE HOME TO PREVENT THE SPREAD OF WEST NILE VIRUS

Life Cycle of the Mosquito

Mosquitoes have a four-stage life cycle: egg, larva, pupa and adult. Only female mosquitoes need a blood meal, which they require to develop their eggs. Both males and females feed on nectar for their food source. During its life, a mosquito may take two or three blood meals and develop several hundred eggs each time. Mosquitoes may live four to eight weeks. All female mosquitoes lay eggs in or around water. The eggs hatch into larvae and take about seven days, depending on the temperature to develop into adults. At the water surface, the larva changes to a pupa before emerging as an adult mosquito.

Basic Prevention Measures Are the First Line of Defence

Removing stagnant water breeding areas and taking personal precautions to avoid being bitten by mosquitoes are among the first lines of defence against West Nile Virus. Homeowners are strongly encouraged to remove breeding sites and practice personal protection against mosquitoes. Specific practical advice includes:

- Clean up and empty containers of stagnant water, such as old tires,

flower pots, wheelbarrows, barrels or tin cans that are outdoors. Drill holes in the bottoms of used containers so water can't collect. Change water in bird baths weekly.

- Don't let things pile up. Clear leaves and twigs from eavestroughs, storm and roof gutters throughout the summer. Make sure drainage ditches are not clogged. Check flat roofs frequently for stagnant water.
- Collect lawn cuttings, raked leaves or other decaying debris, such as apples or berries that fall from trees, and recycle or mulch so that organic matter does not end up in storm sewers as a food source for mosquito larvae. Turn over compost frequently.
- Fill in low depressions in lawn areas. Clear out dense shrubbery where mosquitoes like to rest.
- Immediately remove water that collects on pool covers. Make sure the pool's pump is circulating. Turn over wading pools when not in use.

- Check window screens for holes and make sure they fit snugly into the window frame so mosquitoes will not get indoors. If you don't have screens, consider keeping windows closed between the hours of dusk and dawn.
- Make sure you wear light-coloured clothing such as long-sleeved shirts or jackets and long pants.
- Tuck pants into socks for extra protection when going outside between the hours of dusk and dawn.
- Use insect repellent that has been approved for use in Canada (It will have a PCP number on the front label) and follow directions for use carefully.

Using Pesticides to Control Mosquitoes Around the Home

Homeowners can hire a licensed pest management company to properly and safely apply pesticides to control mosquitoes on their property. These companies are listed under Pest Control in the Yellow Pages of the telephone book. In Ontario, a commercial pest management company must have an Operator's licence issued by the Ministry of the Environment to employ licensed applicators to apply larvicides - pesticides used to control mosquito larvae, or adulticides - pesticides used to control adult flying mosquitoes.

Homeowners can use domestic pesticides on their own property to control mosquitoes. However, the Ministry of the Environment strongly recommends that homeowners focus efforts on personal protection and removing mosquito breeding sites to reduce the chances of being bitten by mosquitoes.

Applying Larvicides

Two domestic larvicide products are available, one containing *Bti* (*Bacillus thuringiensis israelensis*) and another containing methoprene - consult your local hardware or garden centre for product availability- for use by homeowners without the need of a licence or permit if used on their own property.. These products can be applied only to water that is wholly contained on the property and has no outflow off of the property. This includes water in rain gutters, discarded tires, ornamental ponds, puddles, rain barrels, flood water pools, and roadside ditches if the property owner is responsible for the ditch and the ditch has no flowing water.

Private property owners (houses, condominiums and apartments, parking lots, shopping malls, schools, commercial and industrial properties, etc.) who have catch basins located on their property that flow to municipal storm sewers cannot apply larvicides into these water bodies. A larvicide can only be applied into a catch basin by a licensed exterminator who also has obtained a permit from the Ministry of the Environment and permission from the municipality. Screening can be placed over a single back yard catch basin and secured with stones to prevent mosquito adult access. Ensure the screening is frequently cleaned of debris so as not to hamper water drainage into the catch basin.

Bti is a naturally occurring bacterium that provides effective control at certain stages of a mosquito's life cycle. Since the product lasts only a day or two and mosquitoes can complete their life cycle within seven to ten days, repeated applications of this larvicide are necessary to achieve effective mosquito control. Methoprene is a chemical that acts

by preventing the larvae from maturing into adults. It is applied when mosquito larvae have been detected and the granules are gradually released over time. Label directions indicate that the product should last for approximately 21 days.

Artificial ponds can be stocked with fish (e.g., gold fish and Koi) that eat mosquito larvae (do not stock ponds that have an outflow to natural water sources if stocking with non-native fish). Consult the Ministry of Natural Resources (MNR) before stocking any water body. Consider using an aerator to create water surface movement. The local MNR office must be contacted if a landowner is considering draining a wetland and/or a pond.

Applying Adulticides

Private property owners may use adulticides labeled for domestic use from a ready-to-use aerosol or a fogger on their own property without a licence. Several adulticide products containing pyrethroids, malathion and propoxur are available in garden centres and hardware outlets for domestic use. Users are cautioned to apply these products according to label directions to ensure the application is to target areas such as trees and bushes and to ensure that neighbours are not affected. Users should be aware that backyard treatments may be effective only for a short period of time, due to the ability of mosquitoes to fly the short distances from other properties.

More information

Additional fact sheets on the use of pesticides in preventing the spread of West Nile Virus are available on the ministry's Web site at www.ene.gov.on.ca/land.htm.

Information on West Nile Virus is available on the Ministry of Health and Long-Term Care's Web site at www.health.gov.on.ca or by calling the toll-free hotline at 1-877-234-4343.

Fact sheets on pesticides for mosquito control are available on Health Canada's Web site at <http://www.hc-sc.gc.ca/pmra-arla/english/mosquito/mosquito-e.html>.

This fact sheet has been reviewed by the Ontario Pesticides Advisory Committee, a multi-disciplinary committee with expertise on pesticides and pest management.